



## Science and ASWG Update

*Peter Stockman & John Mather*

*Next  
Generation  
Space  
Telescope*

Quarterly



## February 9-10 ASWG Meeting

- *ASWG Meeting @ STScI:*
  - *Members Attending: Fall, Gardner, Hall, Jakobsen (ESTEC), Kirshner, Lilly, Loeb, Margon, Mather, Meyer, Nicholson (new, from Cornell), Rich, Stiavelli, Stockman*
  - *High-level agenda*
    - *Project Briefing (Geithner, Seery)*
    - *ESA Plans (Jakobsen)*
    - *View from HQ (Thronson)*
    - *ASWG Plans (Mather, Stockman)*
    - *DRM (Bely, Stockman, Madau)*
    - *Operations IPT (Petro)*
    - *Science Studies (all members)*
- *Next Meeting : April 14-15, STScI*



## ASWG Activities in 1998-99

### *Key hurdles for NGST Project in 1998/99*

- *SRB #2, Sept. 98*
- *Science Preliminary Non-Advocate Science Review: Oct. 98*
- *Program Management Council : Winter 99*
- *Beginning of Decade Committee activities*

### *ASWG Input:*

- *Revised and prioritized DRM for PNAR & Decade Review*
- *Science Review and advice for SRB, PNAR & PMC:*
  - *Architecture Studies*
  - *ISIM Studies*
  - *Operations Studies*
  - *Charter and selection of Flight Science Working Group*
- *Ongoing feedback on*
  - *International collaborations*
  - *Technical development Progress and Plans*
  - *Overall flight validation plan*
  - *Procurement of Prime, ISIM, & Operations Contracts*
- *Congressional Visits*



## Draft Agenda for Science PNAR

- *Overview of NGST within Origins Strategic Plan*
- *Up-to-date performance estimates for 3 mission concepts*
- *NGST Design Reference Mission (only a handful will be discussed at the actual NAR.) Each program includes:*
  - *Science Objectives*
  - *NGST Uniqueness/Relationship to other facilities/plans*
  - *Observation Strategy*
  - *Key science drivers/requirements*
  - *Overall Scientific Priority (ASWG decides, NAR checks)*
- *DRM performance of mission concepts; implications*
- *Science Operations Concept (policies, program mix, community size, etc.)*
- *Review of ISIM Concepts and Matrix against DRM*



## ASWG Milestones for 1998

- *Design Reference Mission:*
  - *Review assignments: This ASWG Meeting*
  - *Community Outreach email for important NGST programs (1 Mar.)*
  - *Improved exposure time estimator on Web (1 Mar.)*
  - *SIM/NGST Complimentary Science(14-15 April)*
  - *First input of DRM Programs (14-15 April)*
  - *Input of DRM Text (1 May) in LaTeX format*
  - *Internal STScI review of inputs and revisions (1 June)*
  - *Report on DRM (Liege meeting)*
  - *Second Draft of DRM inputs and outcomes (~ 1 July)*
  - *ASWG review and prioritization of DRM (mid July-mid Aug)*
  - *Final Draft of DRM & outcomes (SRB#2)*
  - *Presentation to Science PNAR (Oct. 1998)*



## DRM Science Assignments

- *Early QSOs:*
  - *Loeb*
- *Early Formation of Stars:*
  - *Lilly, Fall, Gardner, Loeb, Madau, Stiavelli*
- *Mid-IR Surveys for Buried Starforming Systems:*
  - *Lilly, Rieke*
- *Galaxy Dynamics at  $z > 2$ :*
  - *Stiavelli, Fall, Lilly, Rieke*
- *SNe Surveys:*
  - *Kirshner, Lilly, Madau*
- *Gravitational lensing, dark matter:*
  - *ESA scientist?*
- *AGN Studies:*
  - *Rieke*
- *Stellar Populations:*
  - *Rich, Margon*
- *Brown Dwarfs & White Dwarfs*
  - *Rich*
- *Finding Planets around Nearby Stars:*
  - *Meyer, Rich*
- *IMF and Protostellar Systems:*
  - *Meyer*
- *Planets, Gaps, Disks;*
  - *Meyer*
- *Kuiper Belt Objects:*
  - *Nicholson*



## Review and Advice for PNAR & PMC

- *Architecture & ISIM Studies:*
  - *How well do likely architectures address key NGST science goals?*
  - *Initial review of proposed & selected ISIM designs: April 14-15 ASWG meeting*
  - *Review of ESA instrument studies: July-Aug ASWG*
  - *Initial Review of architecture study results (DRM): July-Aug ASWG*
  - *Mid-term review of ISIM studies and advice for SRB & PNAR: Sept. ASWG (?)*
  - *Final review of ISIM and Architecture Studies for PMC: Dec. ASWG*



## Operations Trade Study Review for PNAR & PMC

- *Operations trades : Relative Impact of Flight Operations Concepts on science program -- done after DRM is established in summer.*
  - *Precision and verification of target acquisition*
  - *Moving targets?*
  - *Need to re-acquire targets in specific orientation?*
  - *Open vs. time constrained observations*
  - *Recycle time for missed observations*
  - *Targets of opportunity*
  - *On-board data processing*
    - *On-board data and calibration storage*
    - *Downlink data compression*
  - *etc.*
- *Review of Expert Assistant Planning Tool (April ASWG)*



## Science Operations

- *Operations trades : Relative Importance of Science Concepts - done by subcommittee. Preliminary input needed for Science PNAR. Petro & Greenhouse have volunteered to help provide inputs. Mike Rich to chair .*
  - *Role of Flight SWG & Guaranteed time (how much, when?)*
  - *Importance of Large/Medium/Small Programs*
  - *Allocation of time and programs to international partners*
  - *Intellectual property, data rights, and publication policies (consistent with NASA policy)*
  - *Distributed science ops work /science operations center*
  - *Minimizing the science cycle time be minimized*
  - *Expected levels of calibration*
  - *Size of user community and data analysis resources*
- *We expect that the Flight SWG and Science Operations Center will also address these issues -- so the important task is to provide approximate answers for the PNAR and Operations Study.*



## Elements of AO & SWG Selection

- *Programmatics: integrated SIM or module instruments: can we say now which way is more efficient? Need to have draft answer or plan by SRB#2.*
- *Charter and makeup of Flight SWG*
  - *SWG advises Project Manager but is chartered by HQ*
  - *Selection is part of ISIM procurement*
  - *Role of interdisciplinary scientists*
  - *Telescope scientists (how many, what role)*
  - *Classic cost elements include:*
    - *Development of flight instrument designs*
    - *Development of data analysis algorithms*
    - *Preflight SI documentation/handbooks*
    - *Preflight and science verification calibrations*
    - *Development of science program*
    - *Data analysis and publication*
    - *meetings/outreach*
- *Faster, better, cheaper methods for SWG?*